

CONSTRUCTION DOCUMENTS

100% Draft Construction Documents shall consist of the following (Additional types of documents and information may be required for certain projects.):

Construction Drawings

- Standard cover sheet
- Index sheet (may be included on cover sheet)
- General Sheets
 - Overall site plan showing total project
 - Existing conditions (as base)
 - Contractor staging areas (construction storage, field office, construction camp) with adequate space or sequencing needs
 - Construction limits
 - Construction access
 - Survey control, monuments and benchmarks with coordinates and elevations
 - Property lines with bearings, easements, utility corridors and setbacks
 - Proposed construction (i.e. outline of new structures, utilities, roadways, walks)
 - Unique construction requirements
 - Existing conditions plan
 - Existing contours and spot elevations
 - Existing buildings and other structures
 - Existing site features: roads, parking, structures, walks, steps, walls, etc.
 - Existing utilities, above and below ground, shown to scale (inlets, lift stations, propane tanks, septic tanks, culverts, etc.) include spot elevations for each, invert elevations for all below ground structures. Use appropriate symbols for small utility items (i.e. lighting, transformers, pull boxes, manholes, inlets, etc.)
 - Existing land features and vegetation
 - Overall symbol legend and abbreviations list, if applicable.
 - Demolition plan, as appropriate. Demolition may be shown on discipline sheets if more appropriate.

- Civil Engineering Sheets
 - Site Plan
 - Existing conditions (as base)
 - Discipline specific notes, legends, code references, symbols and abbreviations.
 - Monuments and benchmarks identified with coordinates and elevations.
 - Site features: roads, parking, structures, walks, steps, walls, etc.
 - Utilities shown to scale (lighting, transformers, pull boxes, manholes, inlets, lift stations, propane tanks, septic tanks, culverts, etc.) Use appropriate symbols for small utility items (i.e. lighting, transformers, pull boxes, manholes, inlets, etc.
 - Geotechnical testing areas, boring locations, percolation test holes
 - Construction limits
 - Road and Parking
 - Existing conditions (as base) with plan and profile sheet outlines, as appropriate.
 - Plan and profile sheets
 - Typical cross-sections
 - Road and parking cross-sections
 - Road and parking centerline stations, bearings, distances, and curve data (layout tables, as appropriate)
 - Intersections and other site radii identified with radius and coordinates
 - Construction limits
 - Storm Water
 - Existing conditions (as base)
 - Collection, treatment (i.e. settlement ponds), and layouts (plan and profile sheets, as appropriate)
 - Structures plans, elevations and details
 - Construction limits
 - Utilities Plans
 - Existing conditions (as base)
 - Water pumping, treatment, storage, and distribution system layout and profile (plan and profile sheets, as appropriate),

- component sizes, material callouts
 - Wastewater collection, treatment, and disposal system layout and profile, component sizes, material callouts
 - System processes and flow diagrams
 - Utilities (identified for removal or abandonment, as appropriate)
 - Construction limits
- Project Details
 - Details (i.e. trenching details, thrust blocks, water/sewer line crossings, silt fence, sewer cleanouts, manholes, valves and boxes, curb stops, fire hydrants, air release valves, sewage air release valves, irrigation details, pressure relief valves, meters and boxes, pressure regulators, check valves and boxes, backflow preventors, septic tanks, absorption trenches, distribution boxes, piping connections, water well details, lift station details, storm water details, storage tank details)
- Landscape Architecture Sheets
 - Demolition Plan (if required)
 - Existing conditions (as base)
 - Structures
 - Plant material (tree protection, plants to be removed or salvaged)
 - Utilities (identified for removal or abandonment)
 - Storm water protection
 - Site furnishings
 - Clearing and grubbing
 - Construction limits
 - Site Plan
 - Existing conditions (as base)
 - Discipline specific notes, legends, symbols and abbreviations.
 - Storm water protection
 - Site features: roads, parking, structures, walks, steps, walls, etc.
 - Utilities shown, as appropriate, to scale (lighting, transformers, pull boxes, manholes, inlets, lift stations, propane tanks, septic tanks, culverts, etc.) Use appropriate symbols for small utility items (i.e. lighting, transformers, pull boxes, manholes, inlets, etc.
 - Sections and elevations identified
 - Site elements and details identified

- Construction limits
- Site Layout Plan
 - Existing conditions (as base)
 - Roads, parking, walks and service areas:
 - Coordinates for building and site layout (identify location of point – foundation, finish wall. . .)
 - Coordinates for all corner points of walks, parking, walls, and site features (identify location of point – foundation, face of curb. . .)
 - Control point, corner point, and radius point tables
 - Dimensioned traffic markings
 - Dimensioned walks, steps, walls with footings, terraces, drainage and utility structures, and site elements
 - Buildings and structures
 - Finish floor elevations noted
 - Roof overhangs, footings
 - Outdoor lighting
 - Above and below ground utilities, as appropriate
 - Construction limits
- Grading Plan
 - Existing conditions (as base)
 - Existing contours and spot elevations
 - Proposed grading
 - Proposed contours (maximum 2' contour interval with each 10' interval in heavier pen weight and labeled)
 - Spot elevations at all change in gradient, at all corners of walks, walls, parking, drainage inlets and outlets, and all site elements
 - Spot elevations at top and bottom of walls, steps and ramps
 - High points, low points, swale centerlines
 - Storm water protection elements
 - Finish floor elevations at each access point of structures
 - Tree and vegetation protection
 - Utility systems
 - Construction limits

- Planting/Revegetation/Irrigation Plan
 - Plant list with quantities and symbols
 - Details and cross-sections
- Site Details
 - Paving, finishes
 - Erosion control (Storm water protection)
 - Accessibility
 - Stairs, handrails, ramps
 - Site furnishings
 - Typical and special construction details
- Site Elevations
 - Entrances
 - Exterior materials with major site elements
 - Dimensions
- Site Sections
 - Typical sections
 - Stairs
 - Site Walls
 - Material changes/connections, paving (curb/walk)
 - Key site elements
- Sign Plan
 - Traffic signs (park wayfinding and MUTCD)
 - Accessible signs
 - Interpretive signs and waysides
 - Pedestrian and trail signs
 - Unique construction signs
- Architecture Sheets
 - Finalized General sheet(s)
 - Notes, legends, code references, fire safety plan, symbols and abbreviations legends.
 - Wall types

- Finalized Demolition Drawings with Legends
 - Floor Plans
 - Spaces individually delineated and labeled
 - Section cut references
 - General notes and annotations on the same sheet
 - Dimensions
 - Clearly Identify demo work
 - Roof plans
 - Section cut references
 - Plan dimensions
 - General notes and annotations
 - Clearly Identify demo work
 - Building Sections
 - Floor levels
 - Vertical dimensions/floor levels
 - Spaces labeled
 - General notes and annotations on the same sheet
 - Clearly Identify demo work
 - Building Elevations
 - Entrances, window arrangements, doors
 - Exterior materials with major vertical and horizontal joints
 - Roof levels and overhangs
 - Vertical Dimensions
 - General notes and annotations on the same sheet
 - Clearly identify demo work
- Finalized New or Adaptive Use Drawings
 - All Building Floor Plans
 - Spaces individually delineated and labeled
 - Section cuts and detail references
 - Enlarged layouts of special spaces (dimensioned)
 - Plan Dimensions (verified with structural)
 - Finish floor elevations
 - Door swings and marks
 - Window openings and marks
 - Stairs and elevators

- Overhead openings dashed
 - General notes and annotations on the same sheet
 - Material legends
 - Clearly distinguish new work from existing
- All Building Roof Plans
 - General notes and annotations on the same sheet
 - Section cut references
 - Plan dimensions
 - Indicate roof pitch/taper and drainage arrows
 - Gutters and downspouts
 - Primary and secondary roof drains and scuppers
 - Label roof assembly and deck materials
 - Clearly distinguish new work from existing
 - Identify plumbing, HVAC and electrical roof penetrations, equipment, and architectural features
- All Building Elevations
 - Entrances, window arrangements, doors
 - Exterior materials with major vertical and horizontal joints
 - Roof levels and overhangs dimensioned
 - Vertical dimensions and elevations
 - General notes and annotations on the same sheet
 - Clearly distinguish new work from existing
- Building Sections (minimum one longitudinal and one transverse)
 - Floor to floor dimensions (verified with structural)
 - Vertical dimensions with elevation targets
 - Stairs and elevator shafts
 - Typical ceiling heights
 - Room labels
 - General notes and annotations on the same sheet
 - Building and wall section references
 - Detail references
 - Clearly distinguish new work from existing
- Interior elevations
 - Floor to floor dimensions with elevation targets
 - Doors and windows
 - Wall finishes
 - Ceiling heights and finishes

- Materials legends
 - Clearly distinguish new work from existing
 - Floor finishes
 - Accessories with legends
- All Reflected ceiling plans
 - Ceiling configuration and materials legends
 - Lighting fixture layout
 - Clearly distinguish new work from existing
- All roof construction details
- All wall sections referenced to building plans and sections
- All roof, door, and window details referenced to plans and schedules
- All special construction details
- All Room finish, hardware, door and window schedules
- All millwork plans, sections, elevations, and details
- All Equipment layouts dimensioned
- Keynotes shall contain complete note, not specification number
- Keynote Legend shall be on the same sheet as keynote reference
- All accessibility dimensions shall be located directly on accessibility layout sheets, not referenced remotely to a standards sheet.
- Structural Sheets
 - General
 - Applicable Codes and Standards
 - Listing of design loads in accordance with IBC 2003, Section 1603
 - Listing of all structural materials used, including material strengths
 - Diaphragm fastening requirements
 - Requirements for special inspection IBC 2003, Chapter 17
 - List of abbreviations
 - Symbols legend
 - Standard Details
 - Standard details applicable to the project
 - Control joint details
 - Reinforcing steel splice length schedule

- Lintel schedule(s)
- Foundation Plan
 - Fully dimensioned foundation plan (references to the architectural drawings for foundation dimensions are unacceptable) including:
 - Overall building dimensions
 - Column gridlines
 - Location of foundation elements with respect to column gridlines
 - Location of slab edges
 - Location of control joints
 - Location of slab recesses
 - Location of elevator pits
 - Location of footing and foundation wall steps
 - Location of foundation wall masonry ledges
 - Size of all foundation elements
 - Foundation wall thickness
 - Top of footing elevations (locating top of footing with respect to finished grade is not acceptable)
 - Masonry ledge elevations
 - Top of wall elevations
 - All required section cuts
- Floor Framing Plan
 - Fully dimensioned floor framing plan (references to the architectural drawings for framing dimensions are unacceptable) including:
 - Overall building dimensions
 - Column gridlines
 - Location of framing elements with respect to column gridlines
 - Top of beam elevations
 - Size and spacing of framing members
 - Locations of openings for floor penetrations
 - Size and direction of span of floor sheathing or decking
 - Camber requirements
 - All required section cuts
- Roof Framing Plan
 - Fully dimensioned roof framing plan (references to the

architectural drawings for framing dimensions are unacceptable) including:

- Overall building dimensions
- Column gridlines
- Location of framing elements with respect to column gridlines
- Top of beam elevations
- Size and spacing of framing members
- Locations of openings for roof penetrations
- Size and direction of span of roof sheathing or decking
- Camber requirements
- All required section cuts

▪ Details

• Foundation Details

- Footing/foundation wall details showing relationship to floor structural system
- Piling/pile cap details showing relationship to floor structural system

• Floor Framing Details

- Connection Details
- Loading diagrams for special load cases for steel bar joists
- Column and base plate schedules for steel buildings
- Column and beam schedules for concrete buildings

• Roof Framing Details

- Connection Details
- Loading diagrams for special load cases for steel bar joists
- Column and base plate schedules for steel buildings
- Column and beam schedules for concrete buildings
- Prefab wood truss profiles with loading diagrams for all load cases

• Mechanical Sheets

▪ Site mechanical plan (if applicable, with all features drawn to scale)

- Detail drawings showing major mechanical details and sections,

including all piping and ductwork connections to mechanical equipment.

- Mechanical floor plans (HVAC, plumbing, and fire protection), with all cross-references between sheets
 - Enlarged scale mechanical plans for mechanical rooms where all necessary plan information cannot be conveyed at a smaller drawing scale.
- Discipline specific notes, legends, code references, symbols and abbreviations.
- HVAC system schematics and flow diagrams
- Mechanical equipment schedules
- Plumbing fixture connection schedule
- Plumbing isometrics or riser diagrams for water systems and drain, waste, and vent (DWV) systems for each restroom, plumbing stack, or other groups of plumbing fixtures where all information cannot be shown on plan sheets
- HVAC control schematics and sequences of operation
- Electrical Sheets
 - Electrical floor plans, with all cross-references between sheets
 - Enlarged scale electrical plans for critical spaces where all necessary plan information cannot be conveyed at a smaller drawing scale
 - Site electrical plan showing routing with transformers, generators and vaults drawn to scale
 - Detail drawings showing major electrical details and sections, including conduit routing to major electrical equipment
 - Branch circuiting for all electrical devices
 - Discipline specific notes, legends, code references, symbols and abbreviations.
 - Panel board and light fixture schedules
 - Fire alarm matrix, riser and device location plans
 - Lightning protection plans
 - Telecommunication plans
 - Security system plans
 - Control wiring diagrams

Division 1 through 16 Construction Specifications

- Table of Contents: Indicate specification section number, title, and the number of sheets per section.

- [Guide for Specifiers, February 2005](#)
- Division 1 Specifications
 - Update content in Design Development [Division 1 Specification Templates](#) and comply with Construction Specifications Institute's (CSI) Master Format.
- Division 2 through 16 Construction Specifications
 - Division 2 through 16 Construction Specifications shall match the format of Division 1 Specifications.

Contract Price Schedule or Construction Bid Schedule

- Use the [Contract Price/Bid Schedule](#) Template.

Product File

- Copies of catalog cuts, as necessary, to explain all work.

Class A Construction Cost Estimate

- Class A Construction Cost Estimate shall be prepared in a format matching the [Class A Construction Cost Estimate](#) sample.

List of Required Construction Submittals

- Use the NPS [Submittals Template](#).

List of Operation and Maintenance (O&M) Requirements

- Use the [List of Required O&M Data](#) template.

Final Constructability Analysis Checklist

- Finalize the constructability analysis utilizing the [Constructability Checklist](#).

Design Calculations

- Provide all design calculations used to arrive at the final design with narrative, as necessary, to explain all work. The following list is an example of possible calculations that may apply. Additional types of calculations may be required for certain projects:
- Earthwork Design Calculations and Data

- Cut/fill calculations
- Water/Wastewater Calculations and Data
 - Utility sizing calculations
- Structural Design Calculations and Data
 - Final structural calculations, including:
 - Structural design criteria
 - References to applicable code sections (IBC, ACI, AISC, etc.)
 - References to applicable portions of the structure
 - Dead load calculations
 - Snow load calculations
 - Roof/floor live load calculations
 - Wind load calculations
 - Seismic load calculations
 - Gravity system calculations
 - Lateral system calculations
 - Connection design calculations
 - Foundation system calculations
- HVAC Design Calculations and Data
 - Building U value calculations for each conditioned building, demonstrating compliance with ASHRAE 90.1
 - Heating and cooling load calculations for each building, including summaries of all input data, zoning maps, and any assumptions that were made
 - Outside air (ventilation air) calculations
 - Exhaust air calculations
 - Psychometric calculations
 - Heating, cooling, humidifying, and ventilating equipment sizing calculations
 - Pump and fan static pressure calculations and selection curves
- Plumbing Design Calculations and Data
 - Water service and sanitary sewer service capacity calculations for each building
 - Roof drain and drain leader calculations for each building, as applicable
 - Domestic water heater capacity calculations
 - Fuel gas system capacity calculations for each building, if applicable

- Fire Protection Design Calculations and Data
 - Hydraulic calculations for all fire sprinkler systems
 - Hydrant flow test data, if applicable
 - Fire pump and jockey pump capacity calculations, if applicable
 - Pressure tank capacity calculations, if applicable
- Electrical Design Calculations and Data
 - Electrical service calculations for each building
 - Fault current calculations and load summary

100% Draft Construction Documents Submittal Formats

- Submit 100% Draft Construction Documents in [Hard Copy Formats](#). 100% Draft Construction Drawings shall also be submitted in [Electronic Format](#).
 - Construction Drawings
 - Division 1 through 16 Construction Specifications
 - Contract Price Schedule or Construction Bid Schedule (cost fields blank)
 - Contract Price Schedule or Construction Bid Schedule (cost fields filled in based on Class A Construction Cost Estimate)
 - Product File
 - Class A Construction Cost Estimate
 - List of Required Construction Submittals
 - List of Operation and Maintenance (O&M) Requirements
 - Final Constructability Analysis Checklist
 - Design Calculations

100% Complete Construction Documents Submittal Formats

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- List of Required Construction Submittals
- List of Operation and Maintenance (O&M) Requirements
- Final Constructability Analysis Checklist
- Design Calculations

Final Construction Documents Submittal Formats

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 - Final Construction Drawings
 - Final Division 1 through 16 Construction Specifications
 - Final Contract Price Schedule or Construction Bid Schedule
 - Final Contract Price Schedule or Construction Bid Schedule (cost fields blank)
 - Final Contract Price Schedule or Construction Bid Schedule (cost fields filled in based on Class A Construction Cost Estimate)
 - Supplemental Design Reports
 - Final Class A Construction Cost Estimate
 - Final List of Required Submittals
 - Final List of Operation and Maintenance (O&M) Requirements
 - Final Design Calculations